

# इंटरनेट

# मानक

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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

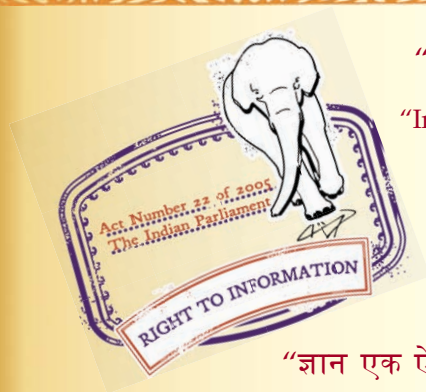
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“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 12107-5 (1987): Methods of chemical analysis of alumino-silicate refractory materials, Part 5: Determination of titanium [MTD 13: Ores and Raw Materials]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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*Indian Standard***METHODS OF CHEMICAL ANALYSIS OF  
ALUMINO SILICATE REFRACTORY MATERIALS****PART 5 DETERMINATION OF TITANIUM**

**1. Scope** — This standard ( Part 5 ) covers a method for determination of titanium ( as  $\text{TiO}_2$  ) in alumino silicate refractory materials.

**2. Determination of Titanium by Spectrophotometric Method**

**2.1 Outline of the Method** — An aliquot of the main solution is treated with hydrogen peroxide. The yellow colour produced is measured in spectrophotometer. Amount of titania is evaluated from the calibration curve obtained under similar conditions.

**2.2 Reagents**

**2.2.1 Dilute phosphoric acid** — 1 : 3 ( v/v ).

**2.2.2 Hydrogen peroxide** — 20 percent by volume.

**2.2.3 Standard titania solution** ( 1 ml = 1 mg of  $\text{TiO}_2$  ) — Dissolve 0.5 g of calcined titania in concentrated hydrofluoric acid in a platinum dish. Then, add carefully 25 ml of concentrated sulphuric acid and heat to strong fumes to remove fluoride. Cool, dilute with water stirring continuously and make up to 500 ml in a volumetric flask.

**2.3 Procedure**

**2.3.1** Transfer two 25-ml aliquots of the main solution [ see 2.3.3 of IS : 12107 ( Part 2 ) - 1987 ] to two 100-ml volumetric flasks *A* and *B*. Add 10 ml of dilute phosphoric acid to each flask. To flask *A*, add 10 ml of hydrogen peroxide. Make up to the volume in both the flasks. Measure the absorbance of solution *A* against solution *B* at 410 nm.

**2.3.2 Calibration curve** — Draw a calibration curve by taking 0, 1, 2, 3, 4 and 6 ml of standard titania solution ( 1 ml = 1 mg  $\text{TiO}_2$  ) into six 100-ml volumetric flasks. Proceed in accordance with 2.3.1 ( without the sample aliquot ) and measure the absorbance of the solutions against solution *B*. Plot the absorbance values against mg of  $\text{TiO}_2$ /100 ml of the solution.

**2.4 Calculation** — Convert the photometric readings of the sample to mg of  $\text{TiO}_2$  by means of calibration curve and calculate  $\text{TiO}_2$  content as follows:

$$\text{Titanium ( as } \text{TiO}_2 \text{ ), percent} = \frac{C}{D} \times \frac{1}{10}$$

where

*C* = mass in mg of titania (  $\text{TiO}_2$  ) found in 25 ml aliquot of the solution, and

*D* = mass in g of the sample represented by the aliquot taken.

## **EXPLANATORY NOTE**

Alumino silicate refractory materials contain alumina ( $\text{Al}_2\text{O}_3$ ) and ( $\text{SiO}_2$ ) in varying portions made synthetically by heating aluminium trifluoride at 1 000-1 200°C with silica and water vapour.

It is used in kilns, ladles and furnaces that operate at higher temperature or under conditions for which fireclay refractories are not suitable.

This Indian Standard has been prepared in different parts to cover the chemical analysis of various constituents in alumino silicate refractory materials. The other parts of the standard are:

- Part 1 Determination of loss on ignition
- Part 2 Determination of silica
- Part 3 Determination of aluminium
- Part 4 Determination of phosphorus
- Part 6 Determination of iron
- Part 7 Determination of manganese
- Part 8 Determination of calcium and magnesium
- Part 9 Determination of sodium and potassium